

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/005997

A. CLASSIFICATION OF SUBJECT MATTER Int.Cl ⁷ H01L21/336, H01L29/78		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) Int.Cl ⁷ H01L21/336, H01L29/78		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922-1996 Toroku Jitsuyo Shinan Koho 1994-2004 Kokai Jitsuyo Shinan Koho 1971-2004 Jitsuyo Shinan Toroku Koho 1996-2004		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 9-162402 A (Ricoh Co., Ltd.), 20 June, 1997 (20.06.97), Full text; all drawings (Family: none)	1-3, 9-17, 21-24
Y	JP 11-289088 A (Matsushita Electronics Corp.), 19 October, 1999 (19.10.99), Par. Nos. [0036] to [0058]; Figs. 1 to 2 & US 2001/0026982 A1	1-3, 9-17, 21-24
Y	JP 2002-231717 A (Texas Instruments Inc.), 16 August, 2002 (16.08.02), Full text; all drawings & EP 1204135 A2 & US 2002/0081862 A1	1-3, 9-17, 21-24
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 12 July, 2004 (12.07.04)		Date of mailing of the international search report 27 July, 2004 (27.07.04)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 10-303141 A (Sony Corp.), 13 November, 1998 (13.11.98), Par. Nos. [0026] to [0039]; Fig. 1 (Family: none)	3, 16, 17
A	JP 3-74878 A (Hitachi, Ltd.), 29 March, 1991 (29.03.91), Full text; all drawings & US 5292673 A & KR 172116 B1	1-3, 9-17, 21-24

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Whereas, (as describe in the extra sheet), for a group of inventions in claims to fulfill the requirement of unity of invention, there must exist special technical features for linking the group of inventions so as to form a single general inventive concept, claims in this international application describes three inventions classified as [1-3, 9-17, 21-24], [4-8, 18, 19], [20].
(Continued to extra sheet)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-3, 9-17, 21-24

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

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Continuation of Box No.III of continuation of first sheet(2)

Whereas for a group of inventions in claims to fulfill the requirement of unity of invention, there must exist special technical features for linking the group of inventions so as to form a single general inventive concept, a group of inventions in claims 1-24 are linked only in terms of a semiconductor device provided with a MIS field effect transistor comprising a silicon substrate, a gate insulation film provided on this silicon substrate via a silicon-containing insulation film and having a high-permittivity metal oxide film, and a silicon-containing gate electrode formed on this gate insulation film.

However, this matter is disclosed in, for example, a prior-art document JP 2002-231717 (Texas Instruments Incorporated), 16 August, 2002 (16.08.02), and therefore it cannot constitute a special technical feature.

Therefore, there exist among a group of inventions in claims 1-24 no special technical features for linking the group of inventions so as to form a single general inventive concept. Accordingly, it is clear that a group of inventions in claims 1-24 do not fulfill the requirement of unity of invention.

Next, the number of groups of inventions, that is, the number of inventions described in the claims of this international application and liked so as to form a general inventive concept will be studied.

Judging from independent claims, claims in this international application describe seven inventions classified as [1-3, 9-13], [4-8], [14, 15, 21-24], [16, 17], [18], [19], [20].

The inventions in claims [1-3, 9-13] and the inventions in claims [14, 15, 21-24], [16, 17] are summarized by the relation between a semiconductor device and a production method thereof.

Similarly, inventions in claims [4-8] and inventions in claims [18], [19] are also summarized by the relation between a semiconductor device and a production method thereof.

In summary, claims in this international applications describe three inventions classified as [1-3, 9-17, 21-24], [4-8, 18, 19], [20].